



EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure



**Savannah River
Remediation**

We do the right thing.

Tank 4 Update

November 14, 2011

Presented to: Citizens Advisory Board

Karthik Subramanian

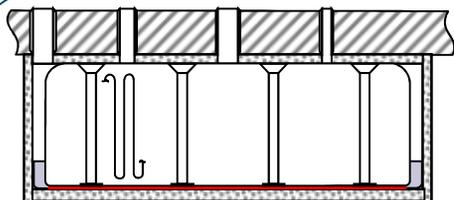
Chief Technology Officer

Savannah River Remediation

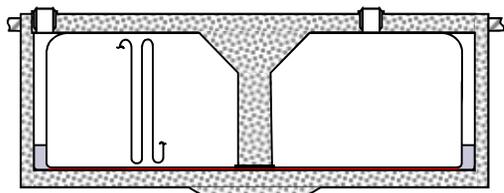
- Routine annual inspections of the waste tanks are performed as part of our program to ensure safe storage of liquid waste,
 - A hairline crack was found in the upper weld of Tank 4, an old-style Type I tank during an inspection
 - The crack is over five feet above the current liquid level in the tank
- The tank remains structurally sound
- There is no impact on safety or operations
- There has been no release to the environment
- This type of condition is not unexpected and should have no significant impact on the remaining activities planned in Tank 4 prior to its operational closure per the Liquid Waste System Plan



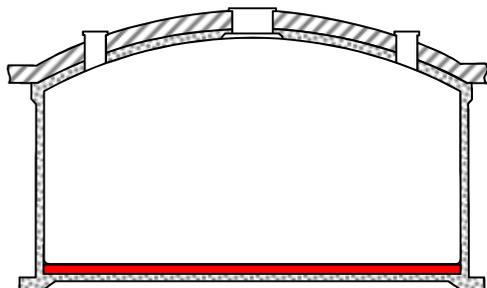
Waste Tanks



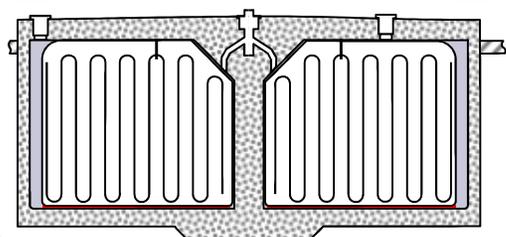
Type I (12)
Old Style
750 kgal
1951-1953



Type II (4)
Old Style
1.0 Mgal
1955-1956



Type IV (8)
Old Style
1.3 Mgal
1956-1960



Type III (27)
New Style
1.3 Mgal
1966-1981

- (24) Old Style Tanks
 - Type I/II: partial secondary containment
 - Routine visual inspections of annulus
 - Monitor and visually inspect during waste removal activities
 - Type IV: single shell tanks (SST)
 - Routine internal visual inspections
 - Up to 50 years old
 - Do not have full secondary containment
 - (2) have been closed
 - No active leaksites today
- (27) New-Style Tanks
 - Full secondary containment
 - No leakage history
 - Receive all new waste
 - Used for all processing activities
 - Comprehensive inspection program
 - Visual inspections
 - Volumetric inspection

- Comprehensive integrated approach to maintaining structural integrity of tanks, a critical component of operations
- Evolving program to successfully address emerging issues and preclude consequential degradation



- Visual Surveillance
 - Still photography
~5000 photos/year
 - Wide Angle
 - Direct
 - Video Camera Inspections
000 video/visual exams/year)
- Type I/II tanks
 - No active leaksites:
waste below all known leaksites
 - Use of conductivity probes in annulus
 - Routine visual inspections of annulus
 - Monitor and visually inspect during waste removal activities



Tank 4 Visual Inspection Results

2003

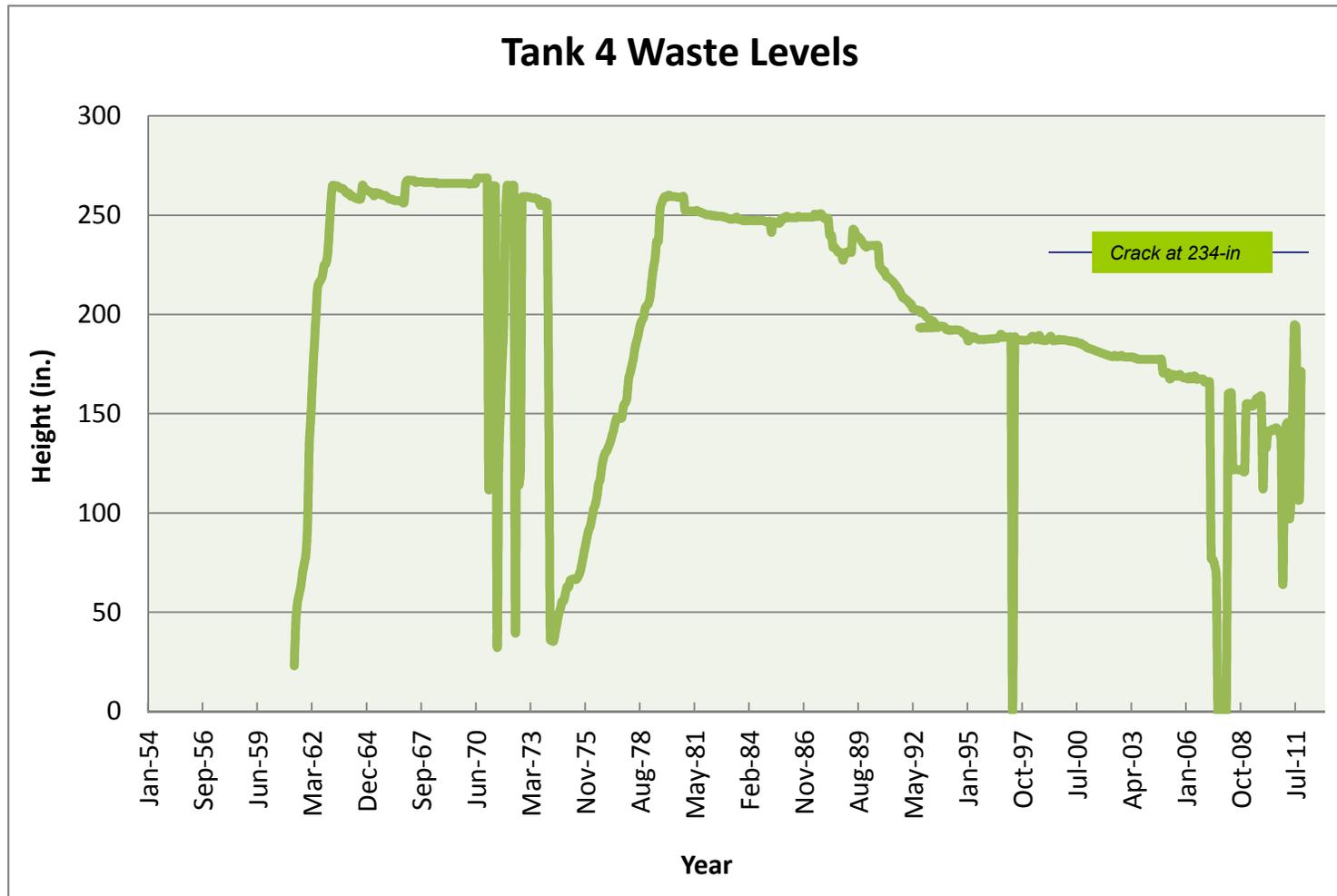


2011



- 2011 inspection photo provided evidence of an indication in the wall of Tank 4, an old-style Type I tank
- After comparison to past photos it was declared a crack
- The operating level for the last 20 years has been below the crack location (234 in).
- The location of the newly identified crack is consistent with our known degradation mechanisms (SCC) for a non heat treated Type I Tank.





- The structural integrity of the tank remains sound with a high margin
- The leak integrity will be maintained by limiting liquid volume below the crack site
- A specific inspection plan will be developed to reduce the risk of leaks in tank 4 during waste removal operations

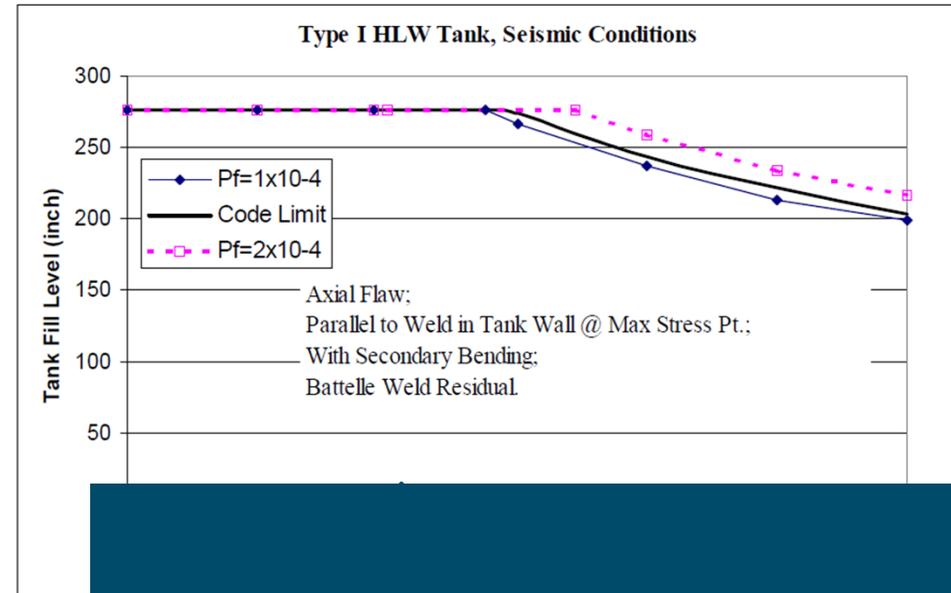
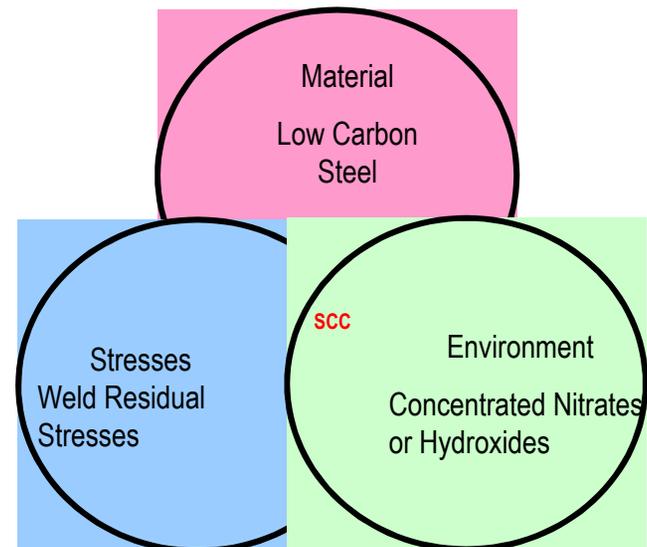
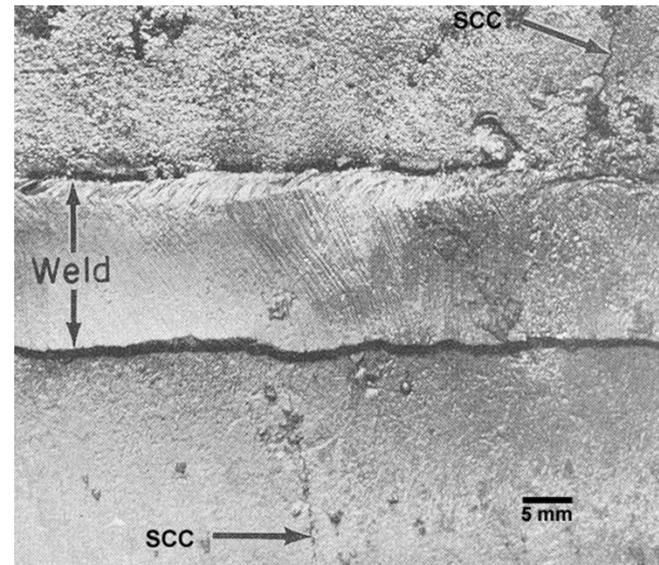


Figure 3-

Analysis at the highest stress levels near the bottom of a full tank shows no impact to structural integrity



- Primary mode of degradation is nitrate-induced stress corrosion (SCC) cracking near fabrication welds or repair welds
- Occurred early in service in non-stress relieved Type I/II Tanks
- Type III Tanks have no known leaksites
 - Better materials of construction
 - Post-weld heat treatment to relieve weld residual stresses
- Corrosion control program to preclude further degradation
- Corrosion control program has been successful in preventing any liquid leaks



- SRS continues to inspect all waste tanks as part of a comprehensive SI program
- A hairline crack was found in the upper weld of Tank 4, an old-style Type I tank during a routine annual inspection
 - The crack is over five feet above the current liquid level in the tank
 - The tank remains structurally sound
 - There is no impact on safety or operations
 - There has been no release to the environment

